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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/672,493	09/29/2000	Pallab Dutta-Choudhury	PM 271374	2629

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EXAMINER	
CARTER, AARON W	

ART UNIT	PAPER NUMBER
2625	

DATE MAILED: 08/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/672,493	DUTTA-CHOUDHURY ET AL.	
	Examiner	Art Unit	
	Aaron W Carter	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,7-9,13-15 and 18-23* is/are rejected.

7)☒ Claim(s) *4-6,10-12,16 and 17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 September 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 14, 2004 has been entered.

Response to Arguments

2. Applicant's arguments filed on July 14, 2004 have been fully considered but they are not persuasive.

Applicant argues that Su does not teach or fairly suggest "associating the single region of alignment interest with a plurality of regions of inspection interest within the object image", and in particular does not disclose a "plurality of inspection regions".

Examiner disagrees, Su discloses a single region of alignment, column 2, lines 4-13, the operator designates a region of inspection interest, column 2, lines 14-16, the machine automatically associates the alignment region with the inspection region, column 2, lines 16-18, and then the process is repeated and the region of alignment is associated with another region of inspection interest, therefore in the broadest sense of the limitation presented, it can be said that Su "associates a single region alignment with a plurality of regions of inspection interest".

Applicant argues that Michael does not teach or fairly suggest training at least one inspection tool for each inspection region.

Examiner disagrees, Michael discloses an inspection tool in the Abstract, wherein GTC is the tool, he discloses multiple inspection regions in column 1, lines 52-60 and he discloses training the GTC for the inspection regions in column 14, lines 42-53. Therefore in the broadest sense of the limitations presented it could be said that Michael trains at least one inspection tool for each inspection region.

The final rejections made in the previous action mailed out on March 11, 2004 will remain in place and can be seen below.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-3 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,608,920 to Su et al. ("Su") in view of US Patent 5,640,200 to Michael.

As to claims 1, 7 and 8, Su discloses a method of training an object visual inspection system the method comprising:

Specifying a single region of alignment interest within an object image (column 2, lines 4-18 and column 4, lines 28-29);

Associating the single region of alignment interest with a plurality of regions of inspection interest within the object image (column 2, lines 15-18 and 30-32); and

Associating each of the plurality of regions of inspection interest with at least one respective inspection tool (column 1, lines 33-44 and column 2, lines 30-32, wherein the alignment region is associated by vectors to a plurality of measurement sites on a semiconductor device which are each inspected with the critical dimension measurement tool).

Su further discloses training of the alignment region from die to die, but neglects to explicitly disclose that each of the regions of inspection interest are trained for their respect critical dimension measurements. However, Michael discloses a method of training multiple inspection regions for at least one inspection tool (column 1, lines 52-60 and column 14, lines 43-46 and Abstract, wherein comparison, in the form of intensity or shape, corresponds to the inspection tool and wherein it is trained to incorporate variations caused by the inspection environment). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the method of training an object visual inspection system as disclosed by Su with the training of multiple inspection regions for at least one inspection tool as disclosed by Michael. This would provide the advantage of not only relying on the CAD design rules of circuit patterns for CD measurements sites, but including a "golden template" by training the multiple sites that are on a physical die to incorporate variation caused by the inspection environment, such as video noise (column 14, lines 43-46).

As to claim 2, the combination of Su and Michael disclose the method of claim 1, Michael further discloses wherein training each of the at least one respective inspection tools requires performing statistical training using a plurality of training images (column 14, lines 43-46 and Abstract, wherein comparison, in the form of intensity or shape, corresponds to the inspection tool and wherein it is trained to incorporate variations caused by the inspection environment).

As to claims 3 and 9, the combination of Su and Michael disclose the method of claim 1, Michael further discloses wherein training for each of the plurality of regions of inspection interest, is performed in any order among regions of inspection interest (column 14, 43-46, wherein the regions are trained but no specific order is defined, however it is inherent that they are trained in some order, whatever it might be, and therefore satisfies the limitation of the claim, wherein training is performed in any order).

5. Claims 13-15 and 18-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Su and Michael as applied to claims 1-3 and 7-9 above, and further in view of US Patent 5,796,868 to Dutta-Choudhury ("Dutta-Choudhury").

As to claim 13, Su and Michael disclose the majority of the limitations as discussed above in rejections made for claim 1, they do not however explicitly disclose a camera, display,

processor, memory, etc. However, Dutta-Choudhury discloses a visual inspection system comprising:

A machine vision system coupled to a camera, the machine vision system including (Fig. 1A):

A display that displays the acquired image-data (Fig. 1A);

A processor coupled to the display via a bus (Fig. 1A);

A memory buffer coupled to the display and the processor via the bus (Fig. 1A);

A visual data acquisition system interface coupled to the display, processor and memory buffer via the bus and to the camera (Fig. 1A);

A user interface coupled to the display, processor, memory buffer and visual data acquisition system via the bus (Fig. 1A);

A controller coupled to and controlling cooperation of the display, the processor, the memory buffer, the visual data acquisition system interface and the user interface via the bus (Fig. 1A);

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the machine vision system disclosed by the combination of Su and Michael with the system components as taught by Dutta-Choudhury. This providing the advantages of decreased human involvement in machine vision inspection (column 1, lines 11-28).

As to claim 14, the combination of Sů, Michael and Dutta-Choudhury the system of claim 13, wherein Dutta-Choudhury further discloses, coupled to the machine vision system, a

camera that acquires image-data including a digital representation of objects (Fig. 1A, element 16, column 7, lines 9-13).

As to claim 15, please refer to rejections made for claim 2 above.

As to claim 18, refer to the rejection made for claims 1 and 13 above.

As to claim 19, refer to the rejection made for claims 1 and 13 above.

As to claim 20, the combination of Su, Michael and Dutta-Choudhury the system of claim 19, wherein Michael further discloses wherein the trained image-data includes template image-data (column 9, lines 43-45).

As to claim 21, the combination of Su, Michael and Dutta-Choudhury the system of claim 19, wherein Michael further discloses wherein the trained image-data includes standard deviation image-data (column 10, lines 17-20).

As to claim 22, refer to the rejection made for claim 2 above.

As to claim 23, the combination of Su, Michael and Dutta-Choudhury the system of claim 13, wherein Michael further disclose that the at least one inspection tool is one of an intensity difference inspection tool, feature difference inspection tool or blank scene inspection tool (Michael, column 15, lines 5-9 and column 16, lines 15-18, wherein photometrics corresponds to intensity difference inspection tool).

Allowable Subject Matter

6. Claims 4-6, 10-12 and 16-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron W Carter whose telephone number is (703) 306-4060. The examiner can normally be reached on 7am - 3:30 am (Mon. - Fri.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

awc

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